Headquarters U.S. Air Force

Integrity - Service - Excellence

Natural Infrastructure Management

Part II: *Implementation*

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Office of the
Deputy Assistant Secretary
US Air Force

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"The Infrastructures"

- **Definition of Infrastructure:**
  - **An Integrated System,**
  - **Holistically Managed,**
  - **Supporting the Combat Mission**

- **Examples of Infrastructure:**
  - **Workforce**
  - **Force Protection / Security**
  - **Built**
  - **Logisitical**
  - **Communications / Information Systems**
  - **Natural**

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Infrastructure Management

- Inventory
- Condition
- Value
- Planning
  - Sustain
  - Restore
  - Modernize

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What Does "*Natural Infrastructure*" Really Mean?

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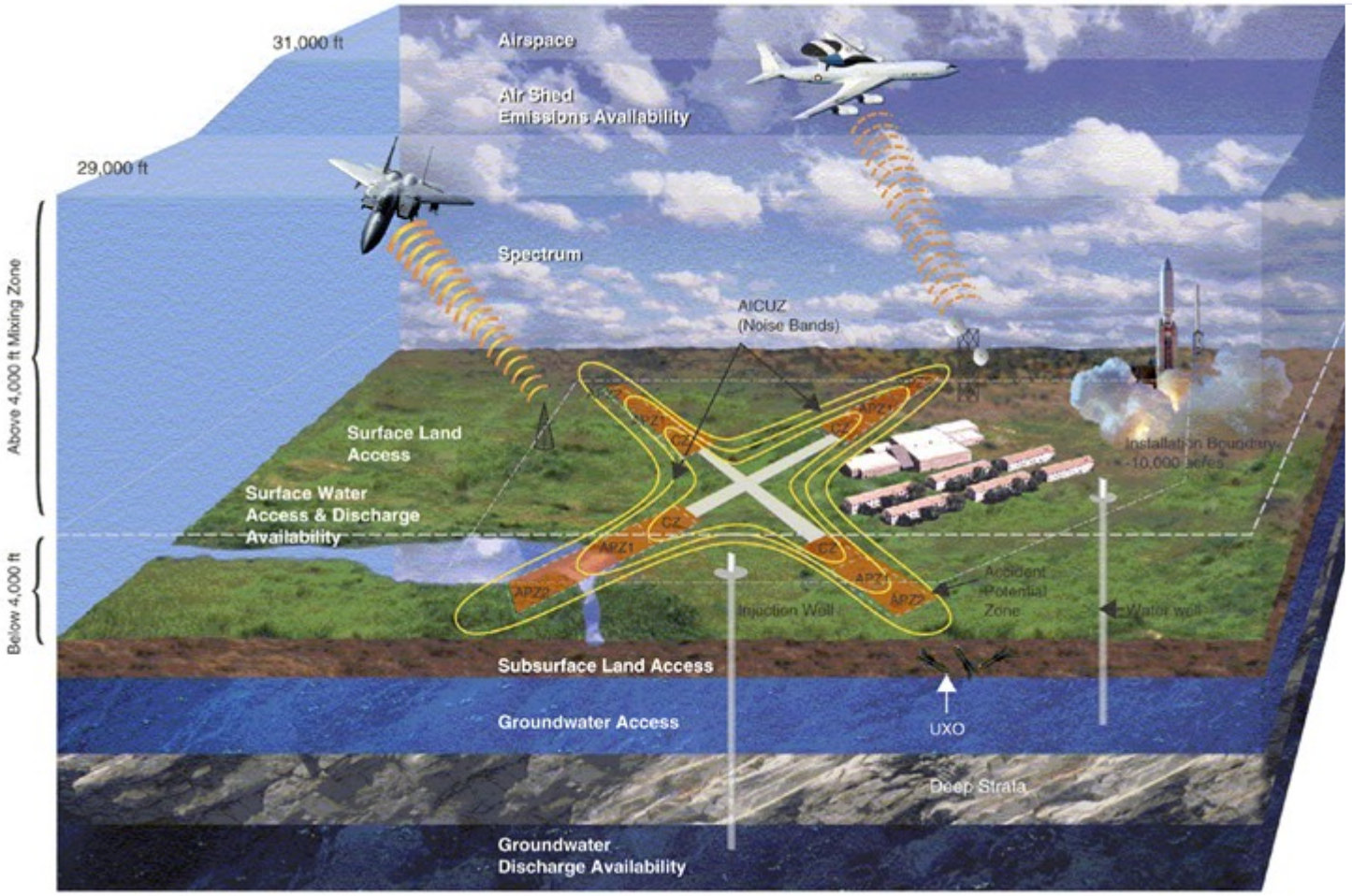
Visualizing the Natural Infrastructure



COMPONENTS

- Airspace
- Air Shed Emissions Availability
- AICUZ (Noise Bands)
- Groundwater Access
- Groundwater Discharge Availability
- Surface Land Access
- Surface Water Access & Discharge Availability
- Subsurface Land Access
- Spectrum

COMPETITION

- Civil Aviation
- Commercial Communication
- Noise Ordinances
- Protected Habitat
- Comm. / Res.

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Characterizing the "Natural Infrastructure"

Resource	Air	Water	Land
Operational Attribute*	•Airshed (emission carrying capacity •Airspace •Airwaves (spectrum)	•Watershed (Supply, Quality, Discharge capacity) •Ecology	•Area •Ecology •Discharge Capacity
Asset**	•Emissions permit •Special Use Airspace •Frequency Allocations	•Water rights •Discharge Permit •Recharge capacity •Wetlands/Species	•Cantonement / Support Services •Buffer Zone •Training Areas •Material disposal capacity •Species Habitat

* - Analyze with Resource Capacity Model (RCM)

** - Analyze with Resource Valuation Model (RVM)

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What We're Changing

- **Focusing Management on the *Entire Natural Infrastructure***
- **Setting Goals to Prevent Encroachment Based On:**
  - **Combat Capability Support**
  - **Performance! (not process…)**
- **Managing the Natural Infrastructure as a *Group of Assets* (not liabilities…)**

Competition for the Natural Infrastructure

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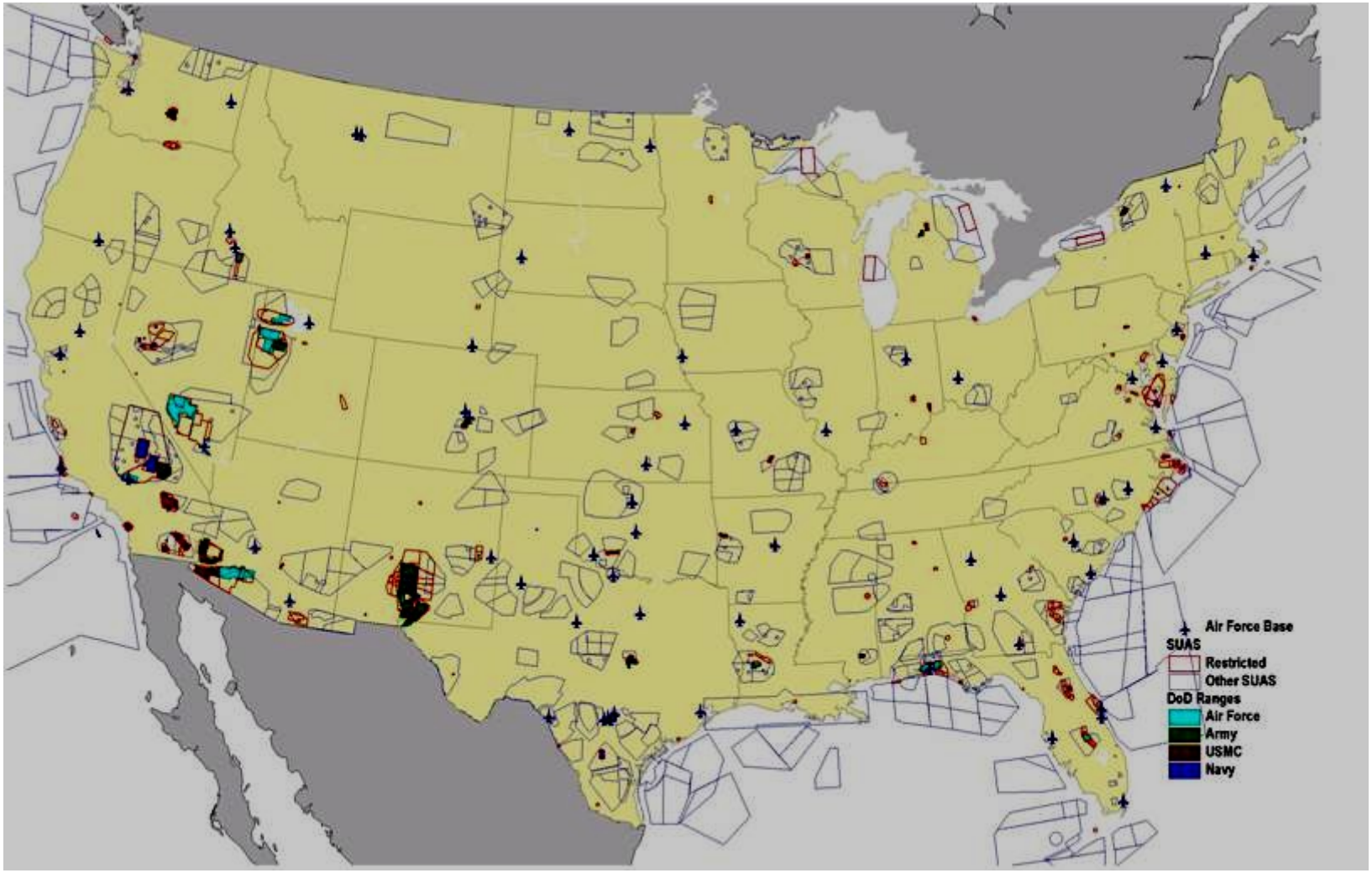
DoD Ranges, Airspace, and AF Bases



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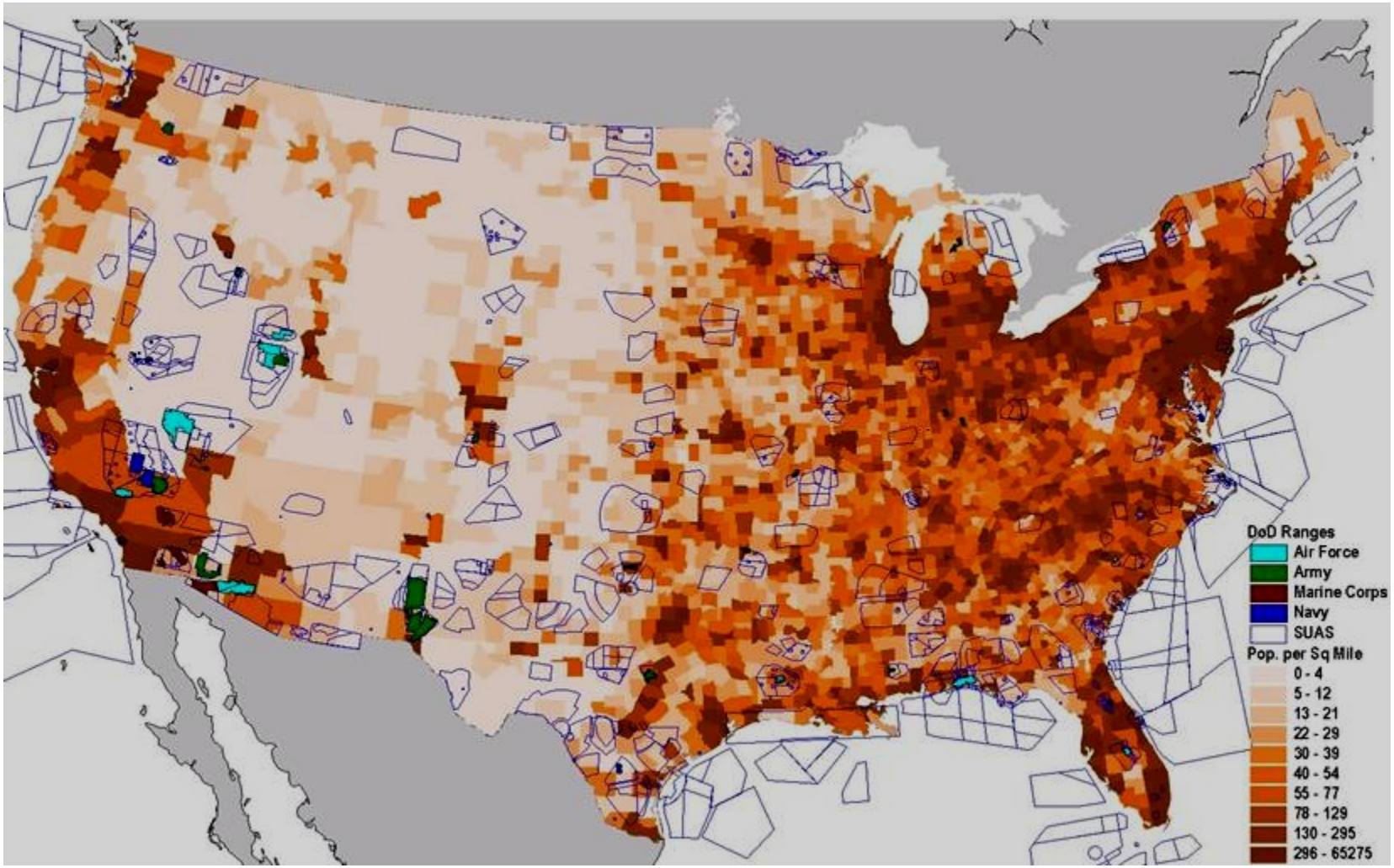
Population, Airspace, DoD Ranges



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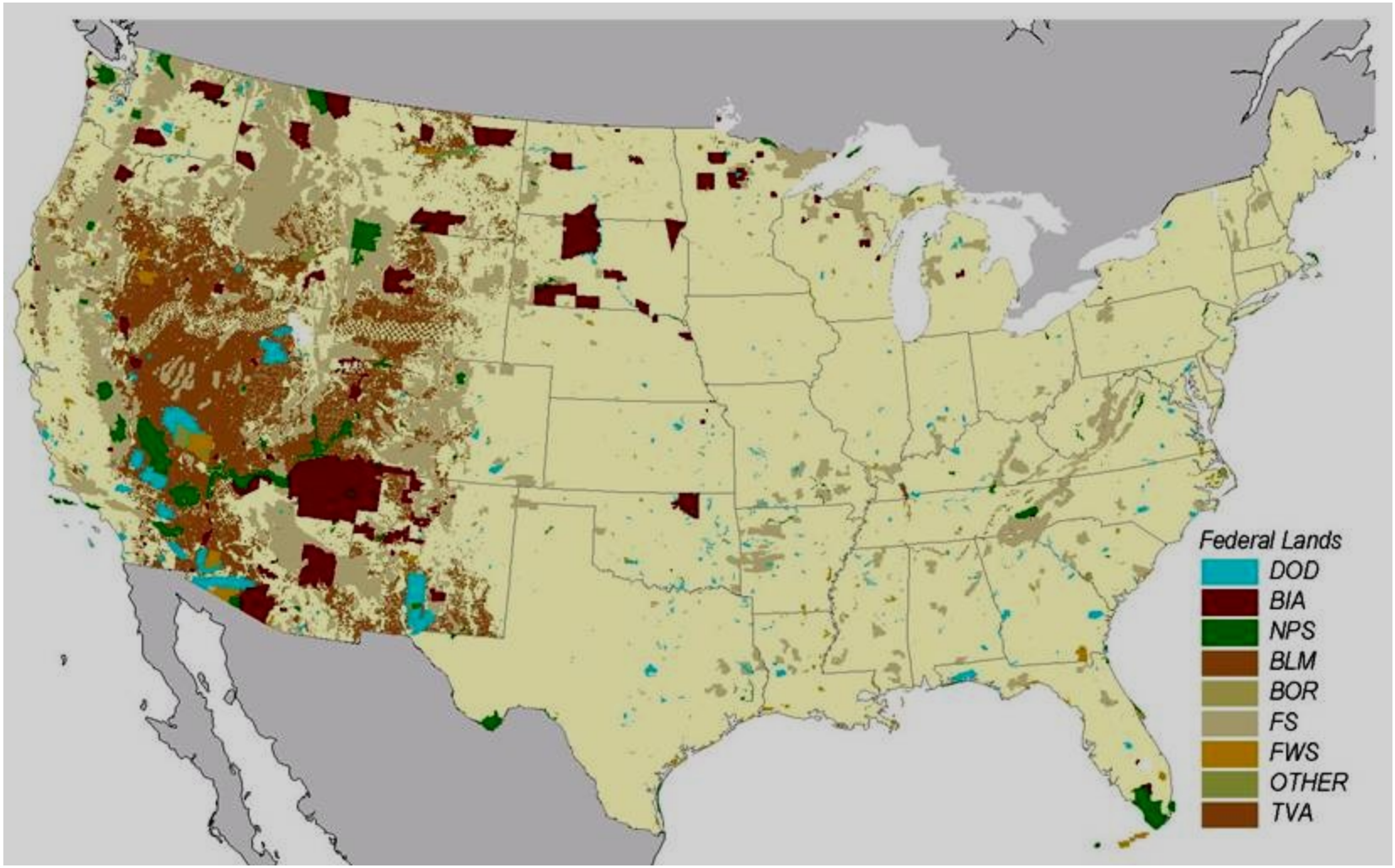
Federal Lands (including DoD lands)



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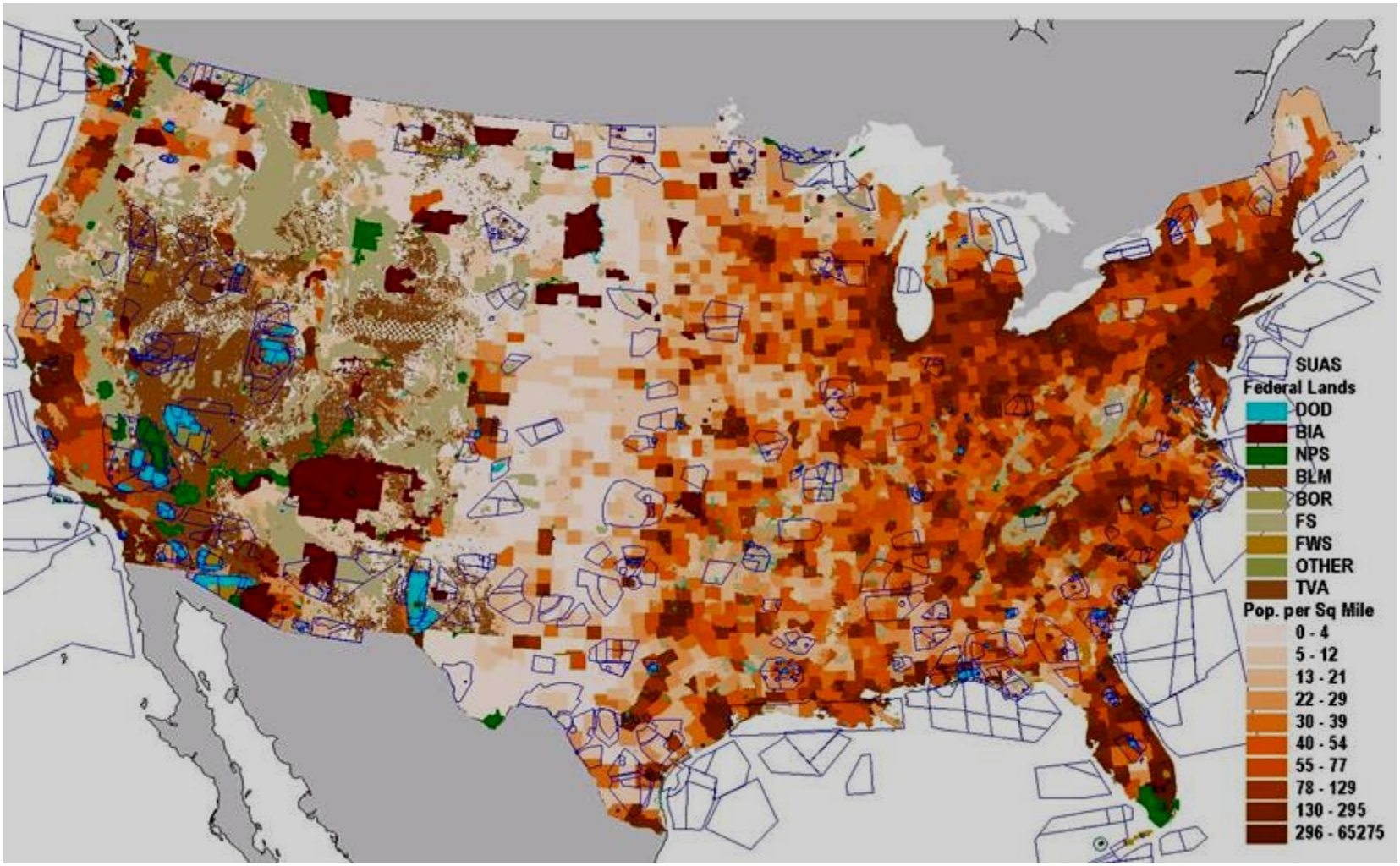
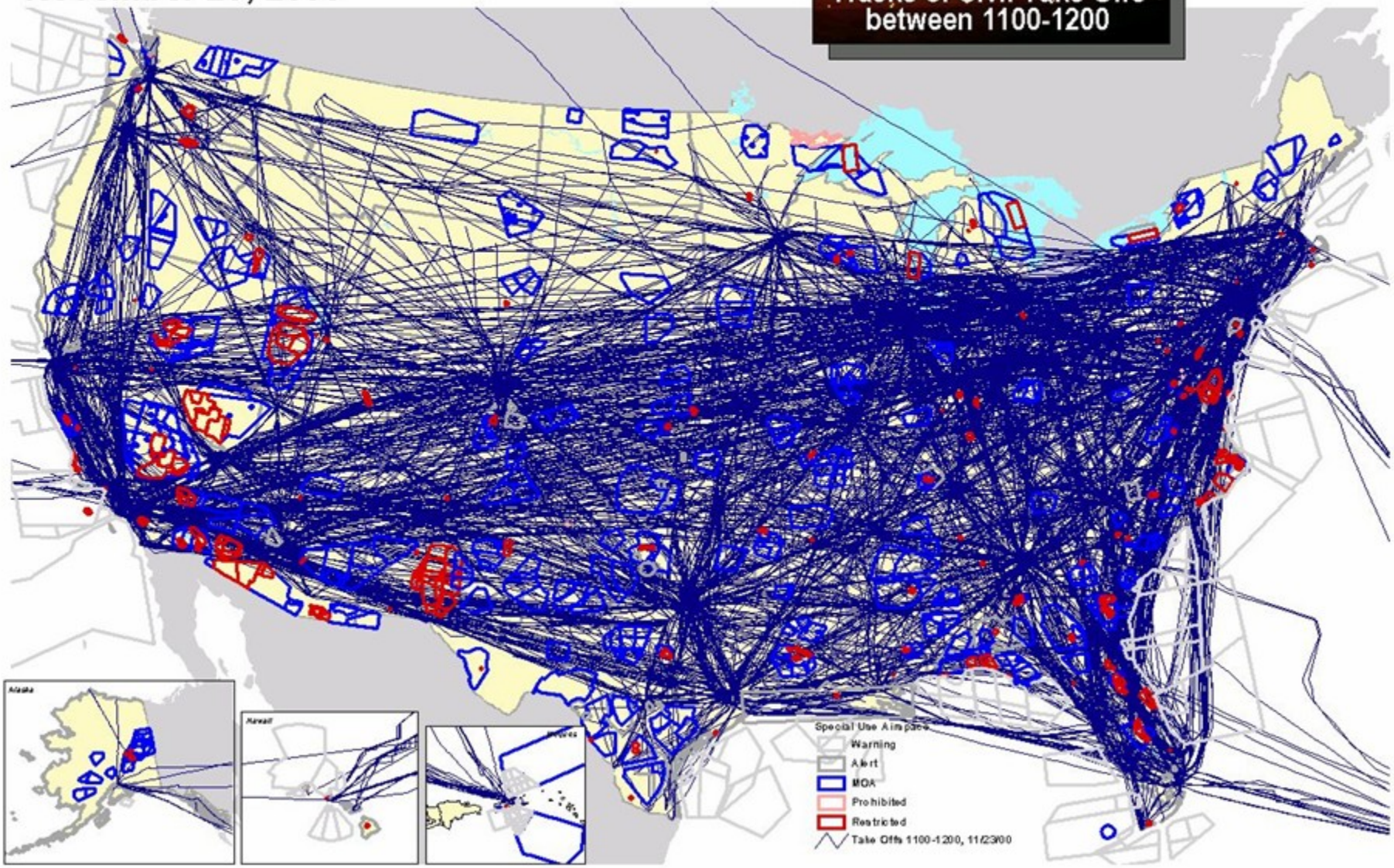
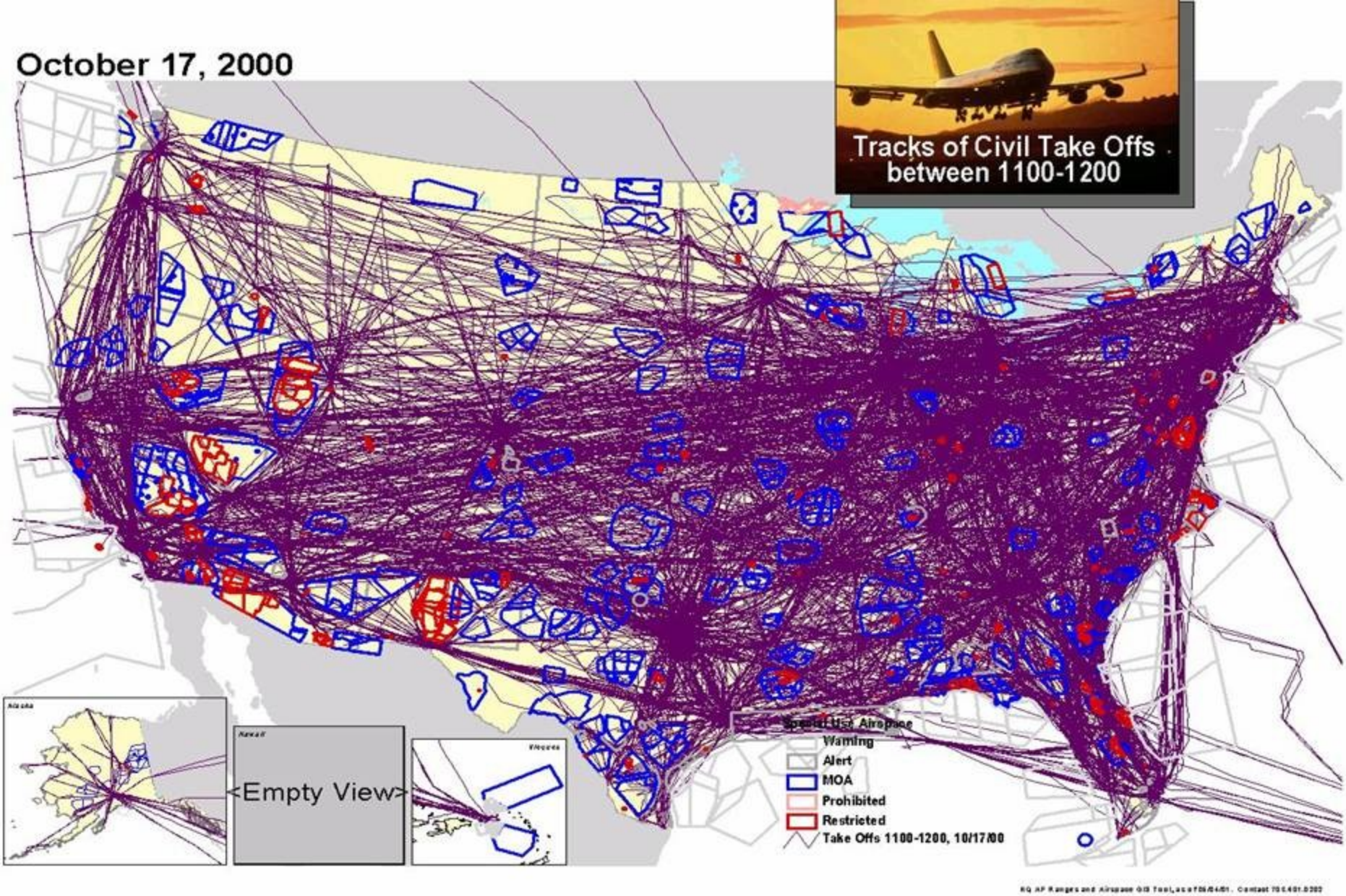
Population, Airspace, Federal Lands



Produced by the HQ AF Ranges and Airspace GIS Project


November 23, 2000
Tracks of Civil Take Offs between 1100-1200
Special Use Airspace
Warning
Alert
MOA
Prohibited
Restricted
Take Offs 1100-1200, 11/23/00


October 17, 2000
Tracks of Civil Take Offs between 1100-1200
Special Use Airspace
Warning
Alert
MOA
Prohibited
Restricted
Take Offs 1100-1200, 10/17/00
<Empty View>

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Definitions

SUSTAINMENT:

Keeping pace with what you need

ENCROACHMENT:

Loss of access to, or degradation of the capability of natural infrastructure to support operations

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Measuring the Impact – the RCM Model

Resource Capability Model (RCM) developed to measure resource adequacy, including resource deficiency and opportunity

RCM Methodology Overview

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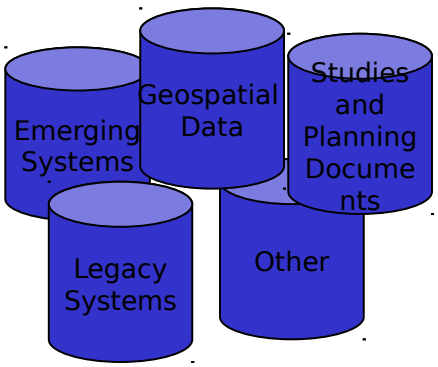
Determine Operational Requirements

Determine Corresponding Resource Requirements

Determine Resource Availability



Compare resource requirements against resource availability for each resource category using metrics

Resource Categories:

- Airspace
- Air Shed Emissions Availability
- AICUZ (Noise Bands)
- Groundwater Access
- Groundwater Discharge Availability
- Surface Land Access
- Surface Water Access & Discharge Availability
- Subsurface Land Access
- Spectrum

Resource Readiness Ratings per Metric*

RO3 – Major opportunities

RO2 -- Significant opportunities

RO1 – Some opportunities

RR – Adequate (Minor opportunities or deficiencies)

RD1 -- Some deficiencies

RD2 -- Significant deficiencies

RD3 -- Major deficiencies

*RO = Resource Opportunity

*RD = Resource Deficiency

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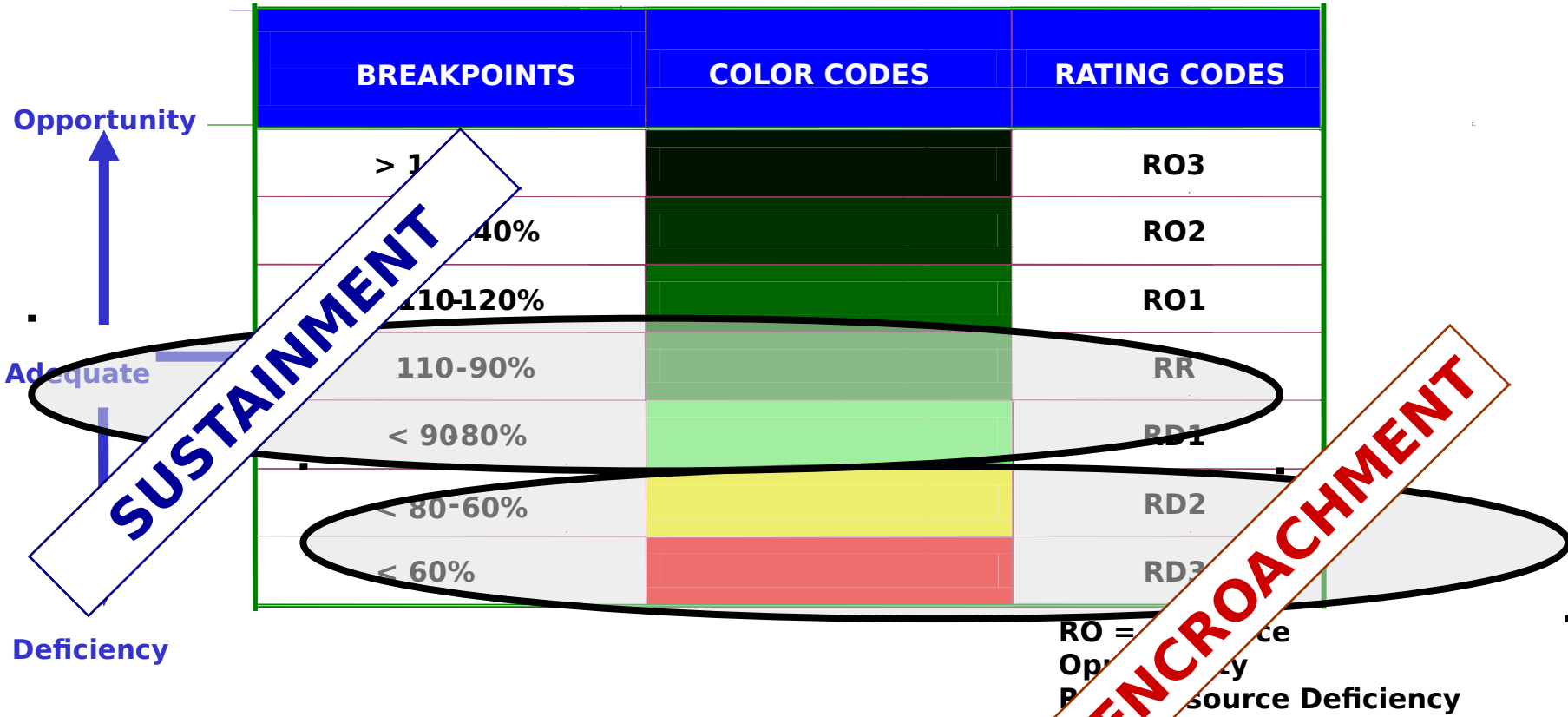
RCM Breakpoints, Color Codes, Rating Codes*



*** Percentages results from comparison of re ce availability to resource requirements, using 100% as the aseline for breakpoints.**

Airspace Readiness Ratings for Poinsett Range

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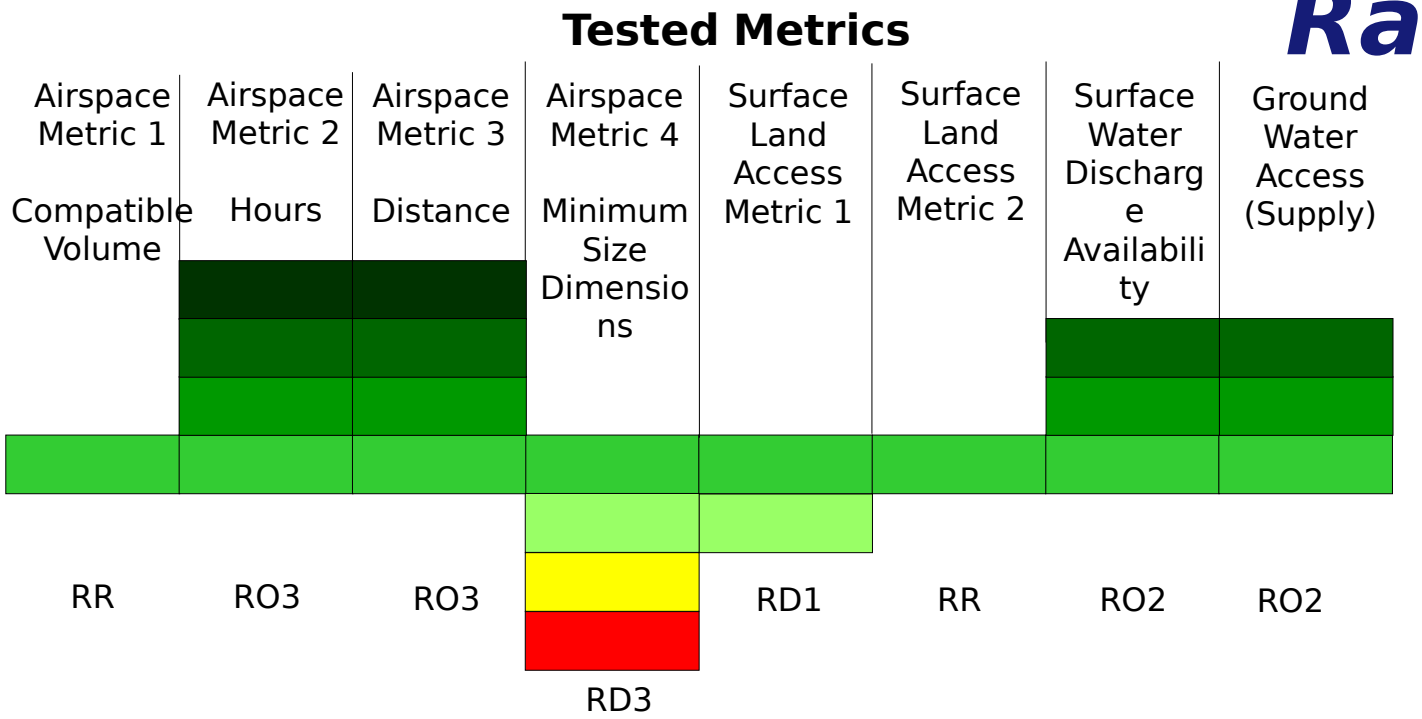


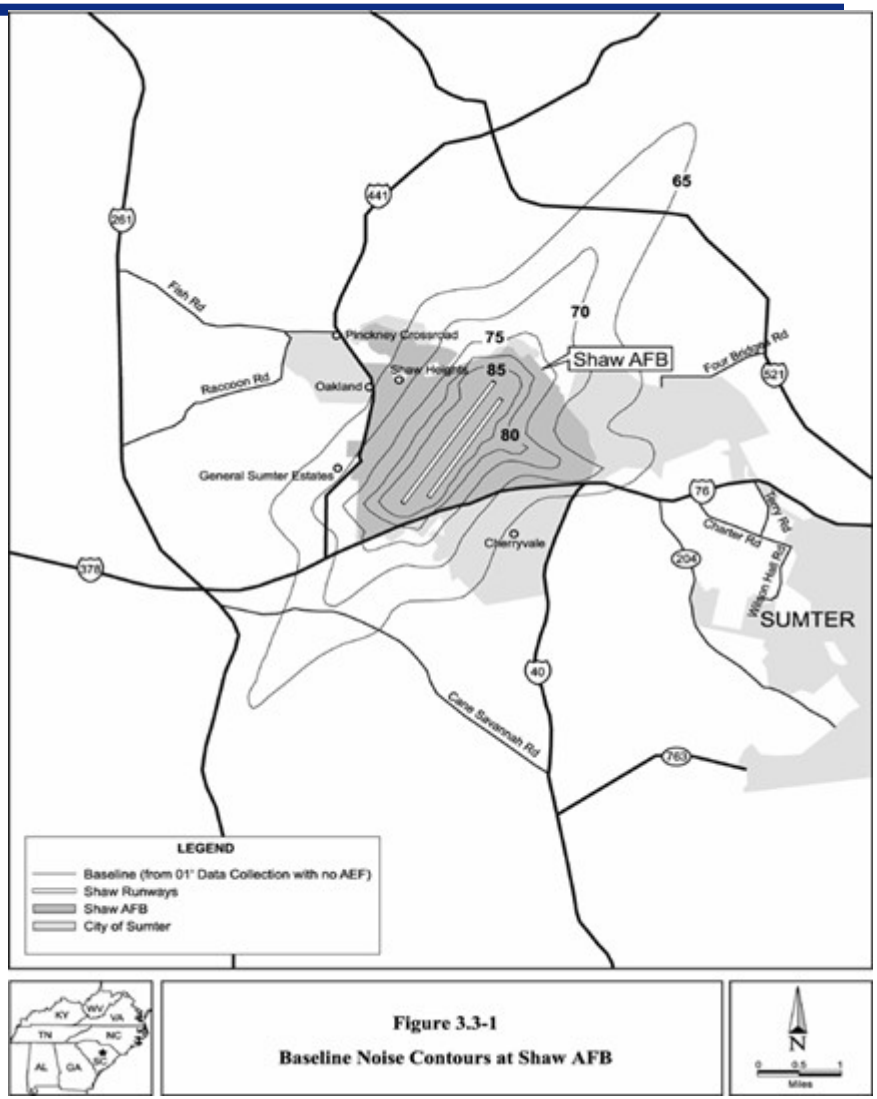
- **Range has some resource opportunity**
- **Approximately 1.4% airspace encroachment using Metric #1 at range**
- **There is no validated method in AF to size airspace for Metric 4. Required airspace dimensions generated by 20 FW staff for pilot test purposes only**
- **Approximately 12.1% off-range surface land encroachment using Metric #1**

Airspace Readiness Ratings for OCONUS Range

Airspace: Installation	Rating	Color
Metric 1: Compatible Volume	**RR**	
Metric 2: Time Volume Denied	**RR**	
Metric 3: Hours	**RO3**	
Metric 4: Distance	**N/A**	**N/A**
Metric 5: Minimum Size Dimensions	**N/A**	**N/A**
Airspace: Range		
Metric 1: Compatible Volume	**RR**	
Metric 2: Time Volume Denied	**RD3**	
Metric 3: Hours	**RO3**	
Metric 4: Distance	**RD3**	
Metric 5: Minimum Size Dimensions – F-16CJ	**RD3**	
Metric 5: Minimum Size Dimensions – A-10	**RD3**	

Surface Land Resource Adequacy Determination

- **Resource *Requirements* defined by acres within 65+ dB contours**
  - Total acres = 9600
  - Off-base acres = 6300
  - On-base acres = 3300
- **Resource *Availability* defined by "compatible acres"**
  - 700 - 945 incompatible acres off-base determined using FAA guidelines
  - 5355 - 5600 compatible acres off-base
  - 85.0-88.8% compatible acres off-base, or 11.2 - 15% encroachment



RCM Pilot Test Chronology

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- 2003
  - **Pilot Test Shaw AFB**
  - **Pilot Test Luke AFB**
  - **Briefed executive summary to XOO, SAF/IEE, XIC, ESOH Committee, DoD ESOH Policy Board, RRPI Executive Group and WIPT**
- 2004
  - **Pilot Test NJANG**
  - **ACC Full Implementation**
  - **Pilot Test Spangdahlem AB**

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Some Practical Implications

- **Traditional Environmental Management Structures Should be “deconstructed”;**
- **Replaced by “Natural Infrastructure Planning”**

- **Natural Infrastructure Requirement Analysis Conducted With or Before:**
  - **Basing Decisions**
  - **Military Planning (Contingencies, Weapon System Design, etc.)**
  - **Environmental Impact Analysis**

Natural Infrastructure Management

THANK YOU

Part I.: *Implementation*

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